REMARKS

Claim 8 has been amended to incorporate the features of claim 5. Claim 8 is also been amended to indicate that the composition is printable and the etching temperature is in the range of 70 - 150 C. Thus,claims 5 and 9 have been cancelled. Claims 14 and 16 have been similarly amended.

Rejections under 35 U.S.C. §103

Claims 2,4-12, 19-24 and 26-28 stand rejected under 35 USC §103 for allegedly being obvious over Szlufcik et al. (US 2004/0063326) in view of Yamazaki (US 6,133,119). Claims 14 and 16 stand rejected as allegedly being obvious over Yamazaki (US 6,133,119) in view of Skorupski et al. Claims 2, 8, 11,12, 22, 24 and 26 stand rejected as allegedly being obvious over Skorupski et al in view of Klien (DE10101923). Claims 2, 5-7, 9-10, 19-21, 23 and 27-28 stand rejected as allegedly being obvious over Skorupski et al in view of Klien and further in view of Yamazaki. Claim 25 stands rejected for allegedly being obvious over Szlufcik et al. (US 2004/0063326) in view of Ohlsen (US 6,641,948).

It is believed that the amendments to the claims render the rejections moot. A skilled artisan looking to prepare a printable etching medium, which is capable of etching very fine lines or structures in silicon surfaces, would not look to fluid compositions or to processes where resin masks are used.

Szlufcik discloses a method for the etching of a semiconductor substrate by use of a caustic etching paste, comprising NaOH, KOH, NH4OH or mixtures thereof. On page 6 at col. 1, lines 2-4, it can be seen that the concentration range of KOH is 10 - 16 % by weight. The pastes are thickened by a thickener (e.g., metal, carboxyalkylcellulose salt or others, like a physically modifed starch). These thickeners are

added to the composition in an amount of 1 - 5 % by weight (see, page 6, column 1, lines 3 - 4). The etching is proceeded at temperatures in the range of 50 -150 °C (see page 4, column 2, paragraph 0056).

There are important differences between the compositons of Szlufcik and the methods of the present invention. The compositions of Szlufcik are not printable in the form of fine lines or layers. Furthermore, they stick to the printing device when it is moved back from the surface. Applicants' have discovered that this significant drawback can be avoided, if water is used as a solvent together with a further organic solvent in at least a low concentration. Szlufcik is silent regarding an etching paste having a mixture of solvents comprising water and at least one other organic solvents. Furthermore, Szlufcik is silent regarding exposure times.

Yamazaki (US 6,133,119) teaches a process for etching of silicon surfaces. A 2% NaOH aqueous solution is applied over the surface. See col. 11, lines 55-64. The medium is aqueous and not thickened. Yamazaki only discloses a method and a liquid composition for roughening a silicon surface to form uneven textures. An aim of the present invention is primarily to remove material from the treated silicon surface and to get even surfaces. Yamazaki discloses a treatment with 2% NaOH aqueous -but not thickened- solution at 80 °C. The etching takes place for 5 min and a roughness of about 0.1 to 5 pm is achieved (see column 11, lines 44 - 64). Yamazaki does not disclose a composition that is printable nor does Yamazaki teach an etching temperature in the range of 70 - 150 C.

Since the method of present the application is carried out using a thickened composition, the diffusion mechanism of the etchant in a thickened, thixotropic solution is entirely different from that in a liquid composition, not only are the etching results entirely different but in order to achieve good results the activating temperature has to be different as well. Furthermore, the etching process can be significantly

reduced with respect to the consumption of etching chemicals since the etching paste is only applied to the areas to be etched.

Thus, a skilled worker would not have combined the teaching of Szlufcik with that of Yamazaki. Neither reference teaches or suggests a etching medium that is printable according to the present invention, particularly suitable for printing fine lines. Nor do they teach or suggust compositions comprising a mixture of solvents (i.e., water and at least one of the different organic solvents) for achieving this purpose.

Skorupski (US 2002/0162218) does not cure the deficiences of Szlufcik and Yamazaki. Skorupski teaches the manufacture of printed circuit boards having improved interlayer adhesion. Skorupski is relied upon for teaching NaOH etching mediums possessing between 8 and 16%wt NaOH. Substrates are chemically etched by running them through a solution (see Example 7). The etching mediums of Skorupski roughen the substrate surfaces in order to achieve a better adhesion of interlayers. Furthermore, like Yamazaki the etching mediums of Skorupski are not printable. Like Yamazaki and Szlufcik, Skorupski does not teach or suggest a mixture of solvents (i.e., water and at least one other organic solvent).

Klein (DE10101923) is relied upon for teaching the addition of a thickener for making an etching solution a paste (see page 4 of English translation) . Klein does not cure the deficiences of the above discussed references. Klein describes the etching of silicon dioxide or silicon nitride with etching compositions comprising fluoride, bifluoride or tetrafluoroborate as etchants, optionally in combination with mineral acids and/or organic acids. Klien does not teach or suggest the selective etching of silicon surfaces. A skilled worker would not look to Klien to modify the teachings of the other references because it discloses etching solutions for entirely different surfaces.

Ichinose et al. (US 5,688,366) discloses etching a transparent conductive film (SnO_2, InO_3, ITO) with a solution that is mixed together with fine resin particles to form a paste. All examples use acidic etching compositions (concentrated sulfuric acid, concentrated hydrochloric acid or ferric chloride) and the liquids are thickened with macromolecular resin particles. Like Klien, Ichinose is silent regarding the etching of silicon surfaces. A skilled artisan would learn from Ichinose to thicken a solution via particulate thickeners. Thickened alkaline liquids of the present invention are not thickened by particulate thickeners.

Ohlsen (US 6,641,948) discloses an aqueous 30 % KOH solution. Ohlsen is silent regarding a printable etching paste. As noted above, an aqueous etching solution is not comparable with the printable compositions of the present application. Ohlsen does not cure the deficiences of Szlufcik or the other references. None of the references teache or suggest a printable etching paste having a mixture of solvents comprising water and at least one other organic solvent. Furthermore, they are silent regarding exposure times.

On page 14 of the Office Action the Examiner asserts that "...one cannot show nonobviousness by attacking the references individually where the rejection is based on a combination of references." However, the combination of the references would not lead a skilled worker to the present invention. None of the cited references teach or suggest an etching medium having from 10-90 % by weight of a solvent which is a mixture of water and at least one other solvent. As stated above Applicants' have discovered that significant drawback can be avoided, if water is used as a solvent together with a further organic solvent. The combined reference teachings do not suggest the advantage or means of achieving a medium that is printable in the form of fine lines or layers.

Based on the above remarks it is respectfully requested that the rejection under 35 U.S.C. §103 be withdrawn.

No fee is believed to be due with this response, however, the Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

/Anthony J. Zelano/
Anthony Zelano Reg. No. 27,969
Attorney for Applicant(s)

/Jennifer J. Branigan/
Jennifer Branigan Reg. No. 40,921
Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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